



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
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November 4, 2016

To: Interested Parties

From: Scott Voss, Fish Biologist, Red Bluff Fish and Wildlife Office

Subject: Biweekly report (October 21, 2016 - November 3, 2016)

Please find attached preliminary daily estimates of passage, 90% confidence intervals, and fork length ranges of unmarked juvenile salmonids sampled at Red Bluff Diversion Dam for the period October 21, 2016 through November 3, 2016. Race designation was assigned using length-at-date criteria.

This report also contains graphical displays of salmonid passage dating back to 2009 for comparison.

Please note that data contained in these reports is subject to revision as this data is preliminary and undergoing QA/QC procedures.

If you have any questions, please feel free to contact me at (530) 527-3043 ext 243.

Table 1.— Preliminary estimates of passage by brood-year (BY) and run for unmarked juvenile Chinook salmon and steelhead trout captured by rotary-screw traps at Red Bluff Diversion Dam (RK391), Sacramento River, CA, for the dates listed below. Results include estimated passage, peak river discharge volume, water temperature, turbidity, and fork length (mm) range in parentheses. A dash (-) indicates that sampling was not conducted on that date.

Date	Discharge volume (cfs) <sup>1</sup>	Water temperature (°C)	Water turbidity (NTU)	Estimated passage				
				BY16 Winter	BY16 Spring	BY15 Fall	BY16 Late-Fall	BY16 RBT
10/21/2016	7,430	13.1	3.2	5,732 (35 – 69)	1,390 (30 – 34)	65 (133 – 139)	668 (71 – 123)	63 (95 – 176)
10/22/2016	7,370	13.3	3.6	4,248 (35 – 67)	1,537 (30 – 34)	28 (157)	399 (74 – 123)	0 (–)
10/23/2016	6,850	13.1	3.3	2,844 (36 – 70)	1,593 (31 – 35)	0 (–)	260 (72 – 113)	0 (–)
10/24/2016	6,590	12.6	3.6	2,525 (36 – 70)	1,861 (31 – 35)	54 (138 – 146)	187 (76 – 112)	0 (–)
10/25/2016	6,690	12.7	4.1	1,528 (36 – 71)	1,507 (30 – 35)	0 (–)	175 (72 – 116)	0 (–)
10/26/2016	8,050	13.2	5.0	5,038 (36 – 71)	1,889 (32 – 35)	124 (164)	2,891 (73 – 128)	0 (–)
10/27/2016	7,560	13.2	4.9	5,355 (37 – 72)	1,262 (31 – 36)	81 (143 – 153)	1,282 (73 – 128)	0 (–)
10/28/2016	8,850	12.9	5.6	3,498 (37 – 71)	1,623 (30 – 36)	56 (133 – 139)	1,035 (73 – 131)	28 (76)
10/29/2016	8,880	13.5	8.3	10,719 (37 – 73)	1,558 (33 – 36)	185 (138 – 153)	2,114 (73 – 130)	74 (71 – 94)
10/30/2016	7,720	13.4	6.9	6,893 (37 – 69)	925 (29 – 36)	0 (–)	1,337 (74 – 119)	112 (105)
10/31/2016	10,600	12.7	5.1	19,888 (38 – 74)	2,711 (33 – 37)	309 (143 – 145)	5,096 (75 – 130)	0 (–)
11/1/2016	10,300	12.7	32.7	20,594 (38 – 74)	4,550 (32 – 37)	0 (–)	2,560 (77 – 129)	0 (–)
11/2/2016	11,400	12.7	19.5	22,765 (38 – 75)	2,497 (31 – 37)	432 (138)	5,657 (76 – 126)	286 (84 – 133)
11/3/2016	8,780	12.1	7.5	5,207 (38 – 75)	1,063 (30 – 37)	0 (–)	638 (77 – 135)	35 (56)
<b>Biweekly Total <sup>2</sup></b>				<b>116,834</b>	<b>25,966</b>	<b>1,334</b>	<b>24,299</b>	<b>598</b>
<i>Biweekly Lower 90% Confidence Interval</i>				89,344	19,994	645	17,680	187
<i>Biweekly Upper 90% Confidence Interval</i>				144,324	31,938	2,023	30,918	1,009
<b>Brood Year Total</b>				<b>480,666</b>	<b>28,795</b>	<b>25,721,500</b>	<b>57,358</b>	<b>27,612</b>
<i>Brood year Lower 90% Confidence Interval</i>				371,002	21,860	-1,450,797	34,000	9,672
<i>Brood year Upper 90% Confidence Interval</i>				590,330	35,730	52,893,796	80,716	45,552

<sup>1</sup> Peak daily discharge values do not account for diversions at RBDD and only represent peak flows registered at the Bend Bridge Gauging station (<http://cdec2.water.ca.gov/cgi-progs/queryFx?bnd>).

<sup>2</sup> Biweekly totals may be greater than the sum of the daily estimates presented in this table if sampling was not conducted on each day of the biweekly period. A dash (-) denotes those dates. To estimate daily passage for days that were not sampled, we impute missed sample days with the weekly mean value of days sampled within the week.

## Juvenile Winter Chinook Salmon Estimated Passage

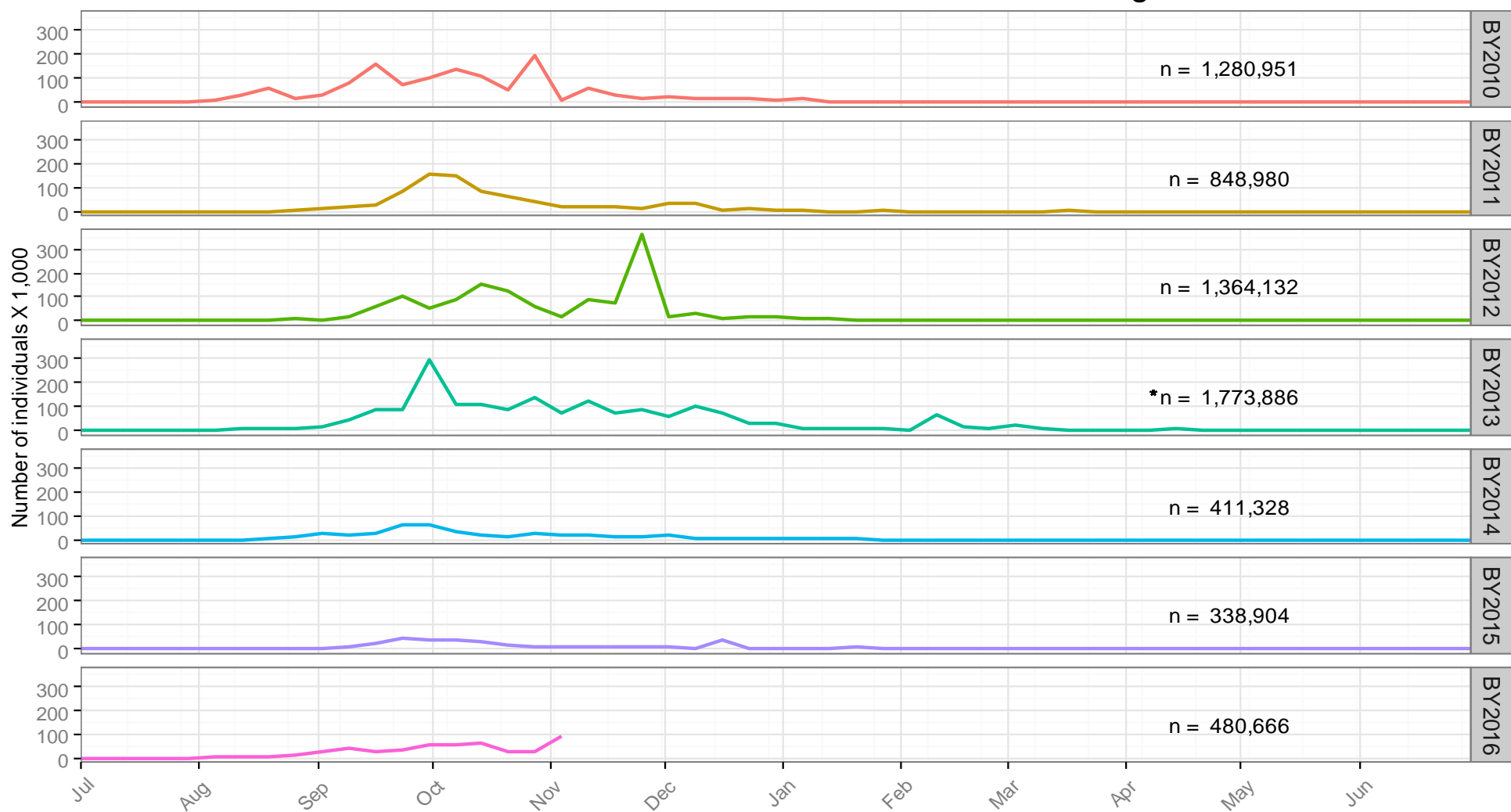


Figure 1. Weekly estimated passage of unmarked juvenile winter Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period July 1, 2010 to present .

\*Winter run passage value interpolated using a monthly mean for the period October 1, 2013 - October 17, 2013 due to government shutdown .

## Juvenile Spring Chinook Salmon Estimated Passage

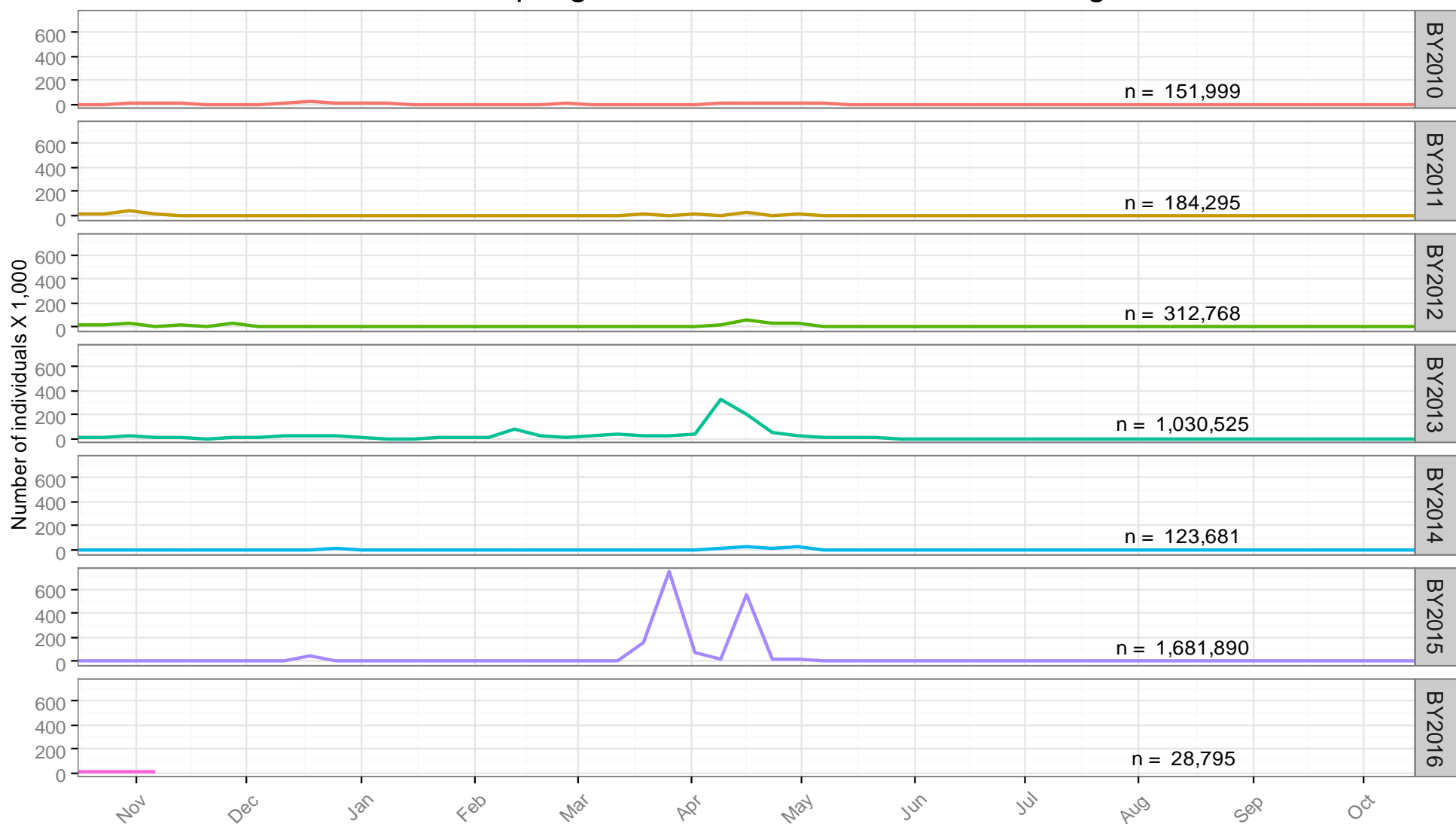


Figure 2. Weekly estimated passage of unmarked juvenile spring Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period October 16, 2010 to present .

## Juvenile *Onchorhyncus mykiss* Estimated Passage

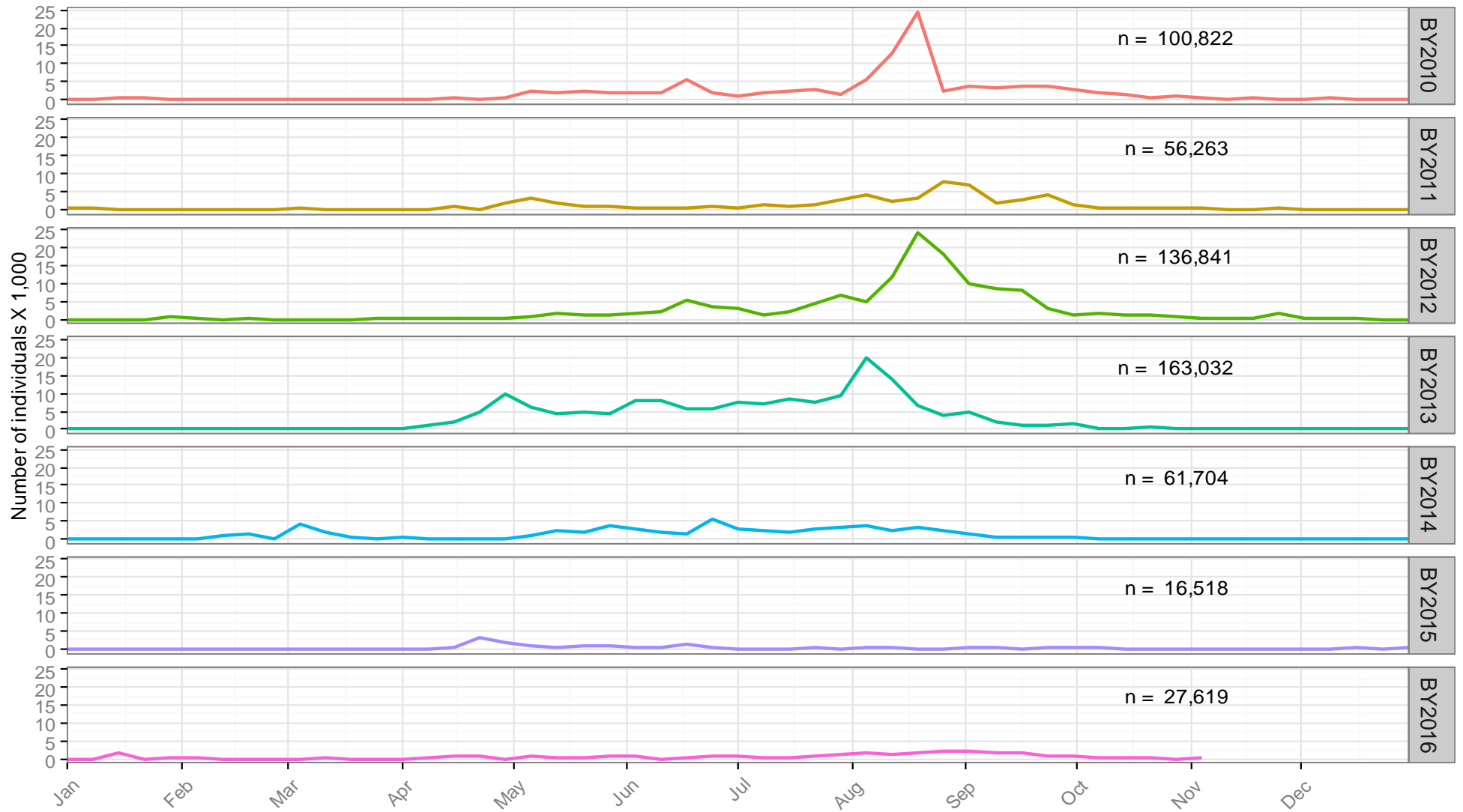


Figure 3. Weekly estimated passage of unmarked juvenile Rainbow/Steelhead trout at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period January 1, 2010 to present.

## Juvenile Fall Chinook Salmon Estimated Passage

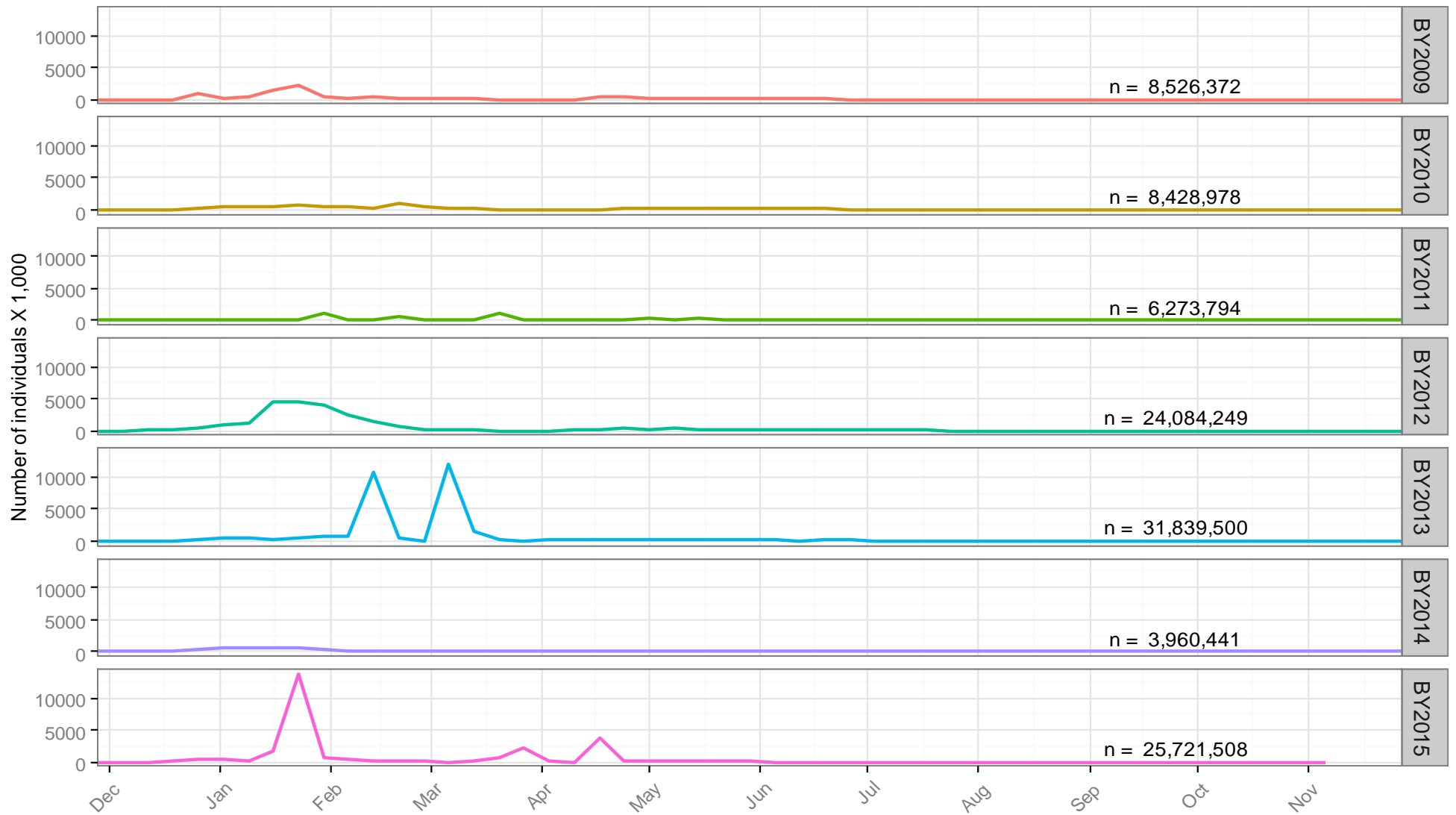


Figure 4. Weekly estimated passage of unmarked juvenile fall Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period December 1, 2009 to present .

## Juvenile Late Fall Chinook Salmon Estimated Passage

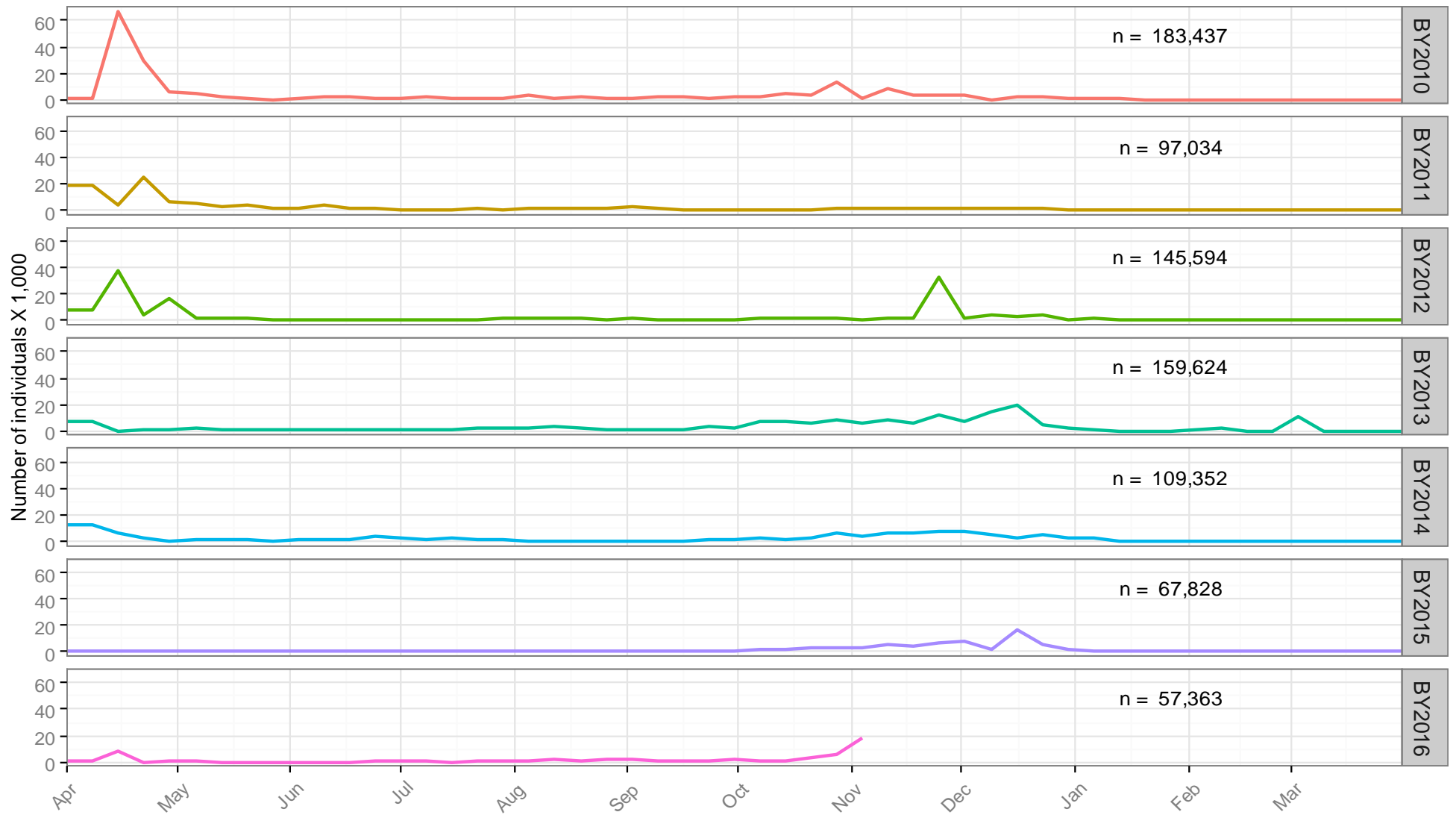


Figure 5. Weekly estimated passage of unmarked juvenile late fall Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period April 1, 2010 to present .

## Weekly Estimated Chinook Passage at Red Bluff Diversion Dam - All Runs Combined

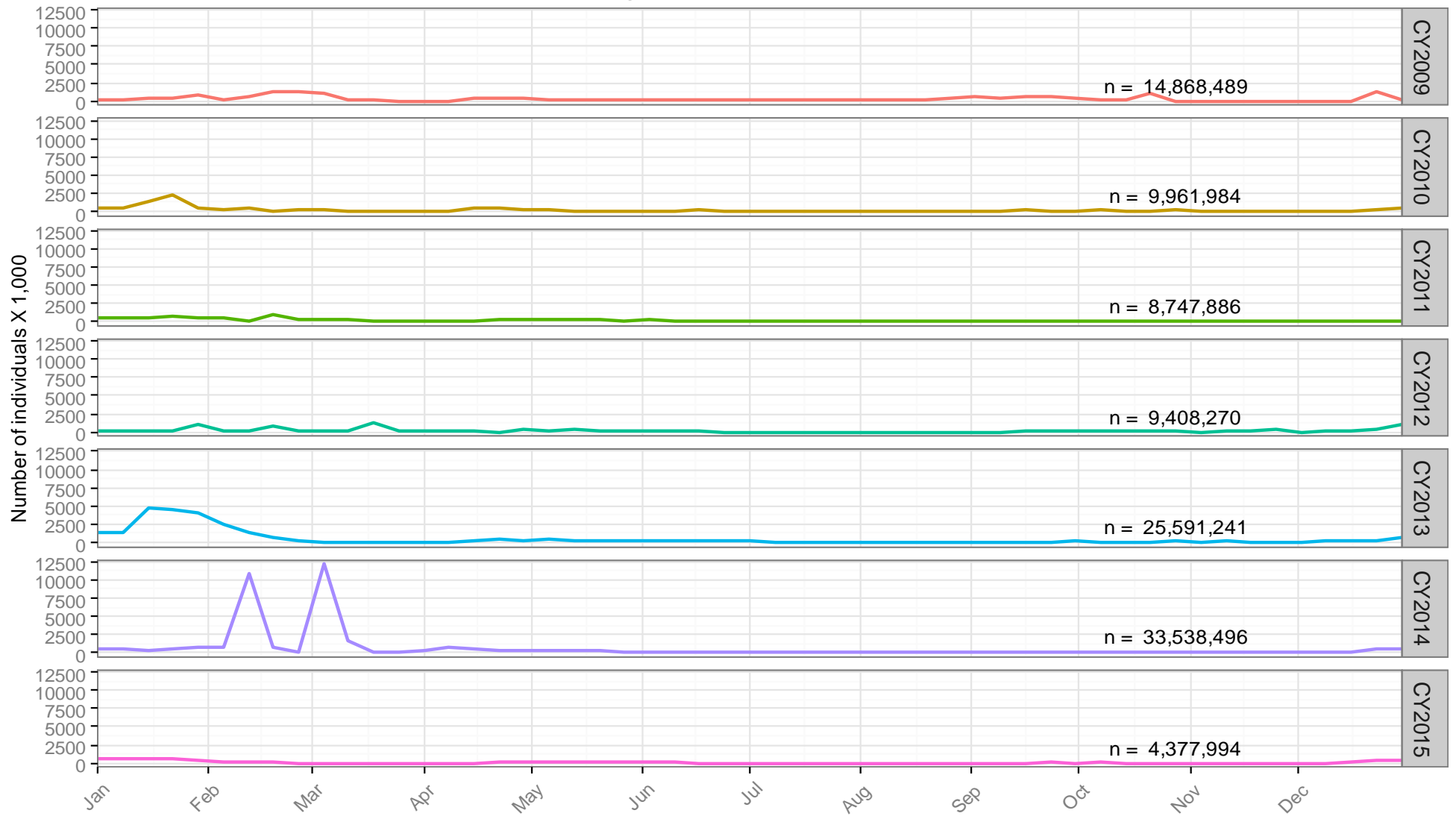


Figure 6. Weekly estimated passage of unmarked juvenile Chinook salmon at Red Bluff Diversion Dam (RK391) by calendar year. Fish were sampled using rotary-screw traps for the period January 1, 2009 to December 31, 2015